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November 14, 2005

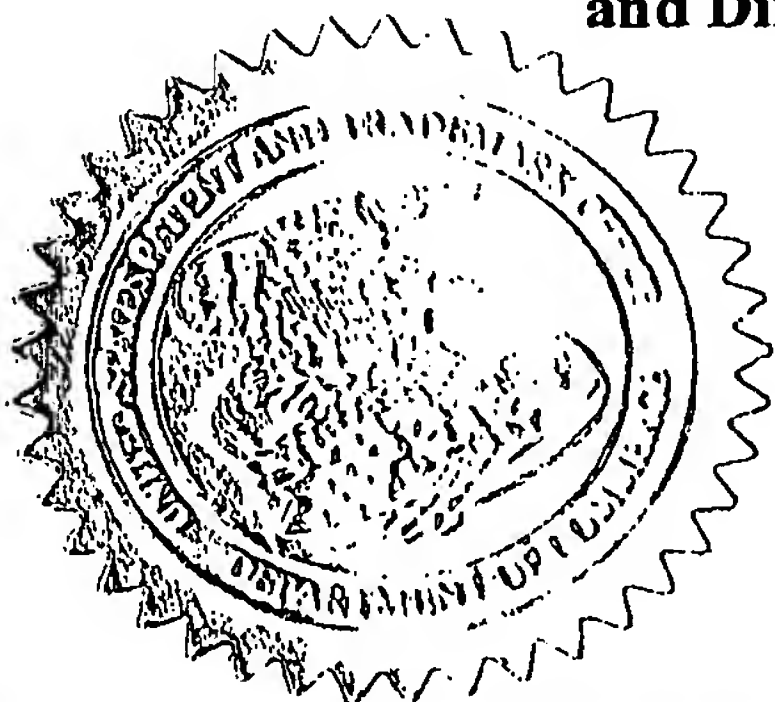
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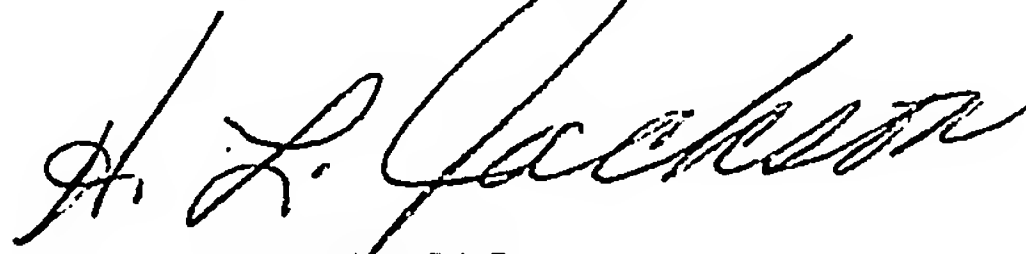
APPLICATION NUMBER: 60/571,339

FILING DATE: May 15, 2004

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Wednesday, May 12, 2004 - 19:22:42

2861 U.S. PTO

Docket No. FlushPat_210

22151 U.S. PTO
60/571339



COVER SHEET

HONORABLE COMMISSIONER OF PATENTS AND TRADEMARKS

Application Type: **Provisional Patent Application**

Sir:

Transmitted herewith for filing is the "provisional" patent application of Robert S. Bosko, 29890 Bulverde Lane #14, Bulverde, Texas 78163 who is a resident of the CANADA, for Method and Apparatus for a Self Cleaning Back Flush Filter.

Please find enclosed:

- ☒ 11 pages of the provisional patent application;
- ☒ Signed Declaration & Verified Statement of Small Entity Status (if applicable);
- ☒ 7 sheets of informal sketches/drawings;
- ☒ Actual Picture of Device (describe any other documents included - do not mail prototypes to the USPTO)
- ☒ \$ 80 USPTO filing fee (made payable to the "Commissioner of Patents")

Respectfully Submitted,

Robert S. Bosko
29890 Bulverde Lane #14
Bulverde, Texas 78163
2108759085

Date:

5-15-04
5-14-04

Docket No. FlushPat_210

CERTIFICATE OF MAILING

In The United States Patent & Trademark Office

In re Application of: **Robert S. Bosko**

Filed: **Provisional Patent Application**

For: **METHOD AND APPARATUS FOR A SELF CLEANING BACK FLUSH FILTER**

Express Mail Serial No.: ER 446869607 US

Mailed To:

Box Provisional Patent Application
Commissioner of Patents
Washington, D.C. 20231

Date of Deposit: 5-15-04
~~5-14-04~~

I hereby certify that the attached United States provisional patent application, drawings and/or sketches and/or pictures, transmittal letter and payment in the amount of \$ 80 are being deposited with the United States Postal Service under Express Mail service on the date indicated above and is addressed to:

**Box Provisional Patent Application
Commissioner of Patents
Washington, D.C. 20231**

Robert S. Bosko
Robert S. Bosko
29890 Bulverde Lane #14
Bulverde, Texas 78163
2108759085

5-15-04
Date: 5-14-04

Thursday, May 13, 2004 - 16:55:16

Docket No. FlushPat_210

PROVISIONAL PATENT APPLICATION

SPECIFICATION

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, Robert S. Bosko, a citizen of CANADA, has invented a new and useful method and apparatus for a self cleaning back flush filter of which the following is a specification:

METHOD AND APPARATUS FOR A SELF CLEANING BACK FLUSH FILTER

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to self-cleaning back flush filters and more specifically it relates to a method and apparatus for a self cleaning back flush filter for cleaning filter devices, extending the filter life by reducing the need for service personnel to replace the clogged filters. The present invention improves existing purification systems that incorporate pre-filtration devices by periodically removing the sediment to drain. The use of high quality water in the secondary flow path maintains flow and pressure that would otherwise decline when pre-filters become clogged.

Description of the Prior Art

It can be appreciated that self-cleaning back flush filters have been in use for years. Typically, self-cleaning back flush filters are equipped with a means for back flushing. Some swimming pool and spa filters have automatic controls for back flushing.

The main problem with conventional self-cleaning back flush filters is that these products are limited by the fact that the water or liquid used in the back flushing mode is the water that was just filtered. This problem of using the water that was just filtered to flow backwards through the filtration medium is only slightly effective. Another problem with conventional self-cleaning back flush filters is that the backflushing is limited in the

fact that the flow path is just reversed and this becomes less and less effective with each back flush attempt. Another problem with conventional self-cleaning back flush filters is that some chemical is injected into the back flow stream to clean the medium and these harsh chemicals are not environmentally friendly.

While these devices may be suitable for the particular purpose to which they address, they are not as suitable for cleaning filter devices, extending the filter life by reducing the need for service personnel to replace the clogged filters. The present invention improves existing purification systems that incorporate pre-filtration devices by periodically removing the sediment to drain. The use of high quality water in the secondary flow path maintains flow and pressure that would otherwise decline when filters become clogged. The main problem with conventional self-cleaning back flush filters is that these products are limited by the fact that the water or liquid used in the back flushing mode is the water that was just filtered. This problem of using the water that was just filtered to flow backwards through the filtration medium is only slightly effective. Another problem with the backflushing systems that are available is the fact that the flow path is just reversed and this becomes less and less effective with each back flush attempt. Also, another problem is that a chemical is injected into the back flow stream to clean the medium and these harsh chemicals are not environmentally friendly.

In these respects, the method and apparatus for a self cleaning back flush filter according to the present invention substantially departs from the conventional concepts and designs of the prior art, and in so doing provides an apparatus primarily developed for the purpose of cleaning filter devices, extending the filter life by reducing the need for service personnel to replace the clogged filters. The present invention improves existing purification systems that incorporate pre-filtration devices by periodically removing the sediment to drain. The use of high quality water in the secondary flow path maintains flow and pressure that would otherwise decline when pre-filters become clogged.

SUMMARY OF THE INVENTION

In view of the foregoing disadvantages inherent in the known types of self-cleaning back flush filters now present in the prior art, the present invention provides a new method and apparatus for a self cleaning back flush filter construction wherein the same can be utilized for cleaning filter devices, extending the filter life by reducing the need for service personnel to replace the clogged filters. The present invention improves existing purification systems that incorporate pre-filtration devices by periodically removing the sediment to drain. The use of high quality water in the secondary flow path maintains flow and pressure that would otherwise decline when pre-filters become clogged.

The general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new method and apparatus for a self cleaning back flush filter that has many of the advantages of the self-cleaning back flush filter mentioned heretofore and many novel features that result in a new method and apparatus for a self cleaning back flush filter which is not anticipated, rendered obvious, suggested, or even implied by any of the prior art self-cleaning back flush filters, either alone or in any combination thereof.

To attain this, the present invention generally comprises a FILTER HOUSING ASSEMBLY, THREE SOLENOID VALVES, a source of purified water from a REVERSE OSMOSIS SYSTEM, steam distiller or deionizing system, a non pressurized STORAGE CONTAINER, a DEMAND DELIVERY PUMP to supply the flow and pressure to the SECONDARY FLOW PATH during the flush mode. and a CONTROLLER to switch from the PRIMARY FLOW PATH to the SECONDARY FLOW PATH. that shuts off the existing inlet water and automatically initiates the secondary flow path that flows in reverse through the filter medium to drain or storage reservoir. The SECONDARY FLOW PATH is integral to the invention and uses the high quality water to maximizes the cleaning effect of the flush event. The present invention is also comprised of a Filter housing with inlet and outlet ports, a Removable filter cartridge, a Wall mounting bracket, an Automatic high flow delivery pump to supply the flush water during the flush event, a Means to store pure water for flush event. e.g. plastic tank with float shut-off, an Irrigation Type Control Timer to initiate flush routines and a Reverse Osmosis system similar to Bosko Patent 6,423,212 issued July 23, 2002.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the invention that will be described hereinafter.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other

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embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of the description and should not be regarded as limiting.

A primary object of the present invention is to provide a method and apparatus for a self cleaning back flush filter that will overcome the shortcomings of the prior art devices.

An object of the present invention is to provide a method and apparatus for a self cleaning back flush filter for cleaning filter devices, extending the filter life by reducing the need for service personel to replace the clogged filters. The present invention improves existing purification systems that incorporate pre-filtration devices by periodically removing the sediment to drain. The use of high quality water in the secondary flow path maintains flow and pressure that would otherwise decline when pre-filters become clogged.

Another object is to provide a method and apparatus for a self cleaning back flush filter that uses high quality pure water to back flush the filter.

Another object is to provide a method and apparatus for a self cleaning back flush filter that incorporates a secondary flow path of pure water to clean the filter cartridge in reverse of the primary flow path. The primary flow path is the existing city or well water inlet flowing through a filter or filters required for equipment such as Espresso Coffee Makers, Ice making Equipment, Steam Ovens, Bread Proofers, Steam WaterDistillers, De-ionizing Systems, Reverse Osmosis Systems, etc.

Another object is to provide a method and apparatus for a self cleaning back flush filter that automatically cleans the filter incorporating electric solenoid valves and a control timer similar to irrigation sytems that initiate watering events according to programmed routines. The present invention employs the use of such commercially available equipment to automate the filter cleaning events.

Another object is to provide a method and apparatus for a self cleaning back flush filter that uses high quality water that has a very low concentration of total disolved solids (TDS). The incorporation of the high quality water is the essence of the invention and the method of how it is introduced into the system to achieve the cleaning process.

Another object is to provide a method and apparatus for a self cleaning back flush filter that incorporates three solenoid valves to accomplish the cleaning process and a supply of stored high quality water that may be processed from, reverse osmosis, steam distillation or deionization. The flush liquid may be the product water from an existing purification system. The invention may integrate such a purification system or the water may be on hand in the form of a pure water storage container placed near the filter to be cleaned.

Another object is to provide a method and apparatus for a self cleaning back flush filter that automatically keeps itself clean eliminating the need for expensive filter

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replacement and the expensive servicing that is required and is a burden in areas where the water is less than potable but even with potable water sources the need for filtration is necessary.

Another object is to provide a method and apparatus for a self cleaning back flush filter that will use a SECONDARY FLOW PATH by shutting down the PRIMARY FLOW PATH at the inlet of the filter housing, VALVE 1, and open VALVE 2 and VALVE 3 simultaneously. This event introduces the SECONDARY FLOW PATH of high quality water that flows in reverse across the filter medium and the water provided in the SECONDARY FLOW PATH is low in total dissolved solids. The goal would be to use 18 megohm quality, but even water that has a reduced total dissolved solids of fifty percent of the water that is being filtered in the PRIMARY FLOW PATH would produce a good result.

Other objects and advantages of the present invention will become obvious to the reader and it is intended that these objects and advantages are within the scope of the present invention.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

Various other objects, features and attendant advantages of the present invention will become fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein:

FIG.1 is a perspective view of the present invention.

FIG.2 is a schematic of the present invention.

FIG.3 is a primary flow path according to the preferred embodiment.

FIG.4 is a secondary flow path for a back flushing filter unit according to the preferred embodiment.

FIG.5 is a method flow chart for using the back flush unit according to the preferred embodiment.

FIG.6 is the automatic self-flushing filter unit according to the preferred embodiment.

FIG.7 is a method flow chart of the self-flushing unit according to the preferred embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, the attached figures illustrate a method and apparatus for a self cleaning back flush filter, which comprises two FILTER HOUSING ASSEMBLIES (F1) & (F2), THREE SOLENOID VALVES (V1), (V2), and (V3), a source of purified water from a REVERSE OSMOSIS SYSTEM, steam distiller or deionizing system, a non-pressurized STORAGE CONTAINER, a DEMAND DELIVERY PUMP to supply the flow and pressure to the SECONDARY FLOW PATH during the flush mode and a CONTROLLER to switch from the PRIMARY FLOW PATH to the SECONDARY FLOW PATH. that shuts off the existing inlet water and automatically initiates the secondary flow path that flows in reverse through the filter medium to drain or storage reservoir. The SECONDARY FLOW PATH is integral to the invention and uses the high quality water to maximize the cleaning effect of the flush event. Also, the method and apparatus is comprised of a Filter housing with inlet and outlet ports, a Removable filter cartridge, a Wall mounting bracket, an Automatic high flow delivery pump to supply the flush water during the flush event, a Means to store pure water for flush event. e.g. plastic tank, container with flexible bag, a Control Timer programmable to initiate up to eight flush events with a maximum duration of one minute, and a Reverse Osmosis system similar to Bosko Patent 6,423,212 issued July 23, 2002.

Filter housing with inlet and outlet ports, Removable filter cartridge and Wall mounting bracket. The filter assembly comprises two filter housings that represent first stage and second stage filters (PF1) and (PF2). The two filter housings employ a means for accepting a sediment filter in the first stage and a carbon block filter in the second stage. The first and second stage incorporate removable cartridges in the preferred embodiment, but could also be the encapsulated throw away versions as well. The assembly includes a wall mounting bracket. The present invention uses two housings but the secondary flow path is plumbed to reverse flow through the first filter and flow forward through the second stage filter. Many different types of filter modules and housings may be used. Industrial filter housings that incorporate multiple cartridges in a reactor chamber can be back flushed by the present invention as long as the SECONDARY FLOW PATH maintains adequate flow and pressure dynamically during the flush event.

Automatic high flow delivery pump to supply the flush water during the flush event. A very simple off the shelf demand delivery pump similar to the pumps used in recreational vehicles as demand water for usage. e.g. Shower, Sinks, Toilet, etc. One example could be any delivery pump or series of pumps that can deliver enough pure water to supply the flush mode. Another example could be a variable speed delivery pump now commercially available, that can be tailored to usage by simply adding more pumps in parallel to maintain velocity during the flush event and still provide enough water for usage.

Means to store pure water for flush event. e.g. plastic tank with float shut-off. A

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storage container that holds enough volume of purified water for the back flush event and for the usage requirement during the flush event. Another example could be any means of storing water unpressurized, such as a plastic tank with a float type shut-off or flexible bag to prevent any secondary contamination from the atmosphere.

Three solenoid valves. The solenoid valves are the type commercially available and used in home improvement for automated irrigation systems. One such supplier is Orbit and another is Toro. The solenoid valves are all identical in the preferred embodiment, but may be of different types and configurations, e.g. two way normally closed, two way normally open, 2-way and 3-way electrically operated or fluid or air operated. The device could also be Ball Valves, manually operated, solenoid valves, electrically operated or fluid/air operated. Another example would be Irrigation Sprinkler Valves.

Irrigation Type Control Timer programmable to initiate up to eight flush events with a minimum duration of one minute. The description of the control timer is a device that exists commercially to initiate flush events similar to the control timers used in irrigation sprinkler control timers. The device could be any electronic timer that has the ability to control solenoids that are electrically operated and that initiate sequences from a pre-programmed event, e.g. Orbit Sprinkler 4 Station irrigation Controller.

Reverse Osmosis system similar to Bosko Patent 6,423,212 issued July 23, 2002. The purification unit in the preferred embodiment is a reverse osmosis system that uses a non pressurized storage incorporating a collapsible expandable bag that prevents any contamination from the atmosphere. An example would be Bosko patent number, 6,423,212 Titled "Microbial Resistant Water Purification and Collection System" issued July 23, 2002. Any existing Reverse Osmosis System, Steam Distiller or De-Ionizing System that reduces dissolved solids and has the capacity to produce enough product water to keep the flush mode (SECONDARY FLOW PATH) operational, can be used. Example: Flush event uses four gallons of pure water during the one minute flush cycle eight events per day. The pure water provider system must be able to produce at least four gallons every three hours. This of course is only one example of many combinations available to the operator of the system.

PRIMARY FLOW (PF), liquid enters the device through city or well water connection "A" and has a fluid connection with valve Number 1 (V1) and Check Valve 1 (CV1) and TEE 1 (T1) at the inlet port of the pre-filter housing. Liquid flows through filter cartridge to outlet port where TEE 2 (T2) is located and goes to usage such as a Reverse Osmosis System, Distiller, or other device needing filtered water. SECONDARY FLOW (SF) is possible when Primary Flow Valve 1 (V1) closes, blocking the path of the inlet liquid, and Secondary Valves V2 & V3 open providing pure water from Reverse Osmosis Storage to be pumped at high flow, in reverse, across filter medium to drain. This function is initiated either manually or automatically using any Timer/Controller such as an irrigation controller. Figure 2 shows the preferred embodiment, but it is very clear, that many types of connections and tubes and any variations can be applied by those who are skilled in the art. The present invention has direct focus on the fact that a secondary flow path of purified water is initiated to

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accomplish the task of keeping the filter clean. It must also be mentioned here that the duration of the flush mode also provides a portion of the pure water to the inlet side of the membrane or purification system being used to provide the liquid for the flush duration. The present invention apparatus shows excellent signs of extending membrane and pump life as well as keeping the filter from clogging. Figures 1 through 7 show many alternative variations.

The system very simply operates by shutting off the flow to the inlet of a filter housing, and with the integral use of two valves that open to allow a secondary source of pure water to be pumped in reverse across the filter medium. This event forces suspended particles and dissolved silica to drain, preventing the particles from embedding themselves on the filter fibers. The flush event using the SECONDARY FLOW PATH also provides a portion of the pure water to flow in the direction of the purifying equipment such as a reverse osmosis system and help keep pump valves, membranes, and flow restrictors from the build up of deposits.

As to a further discussion of the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

ABSTRACT OF THE DISCLOSURE

A method and apparatus for a self cleaning back flush filter for cleaning filter devices, extending the filter life by reducing the need for service personel to replace the clogged filters. The present invention improves existing purification systems that incorporate pre-filtration devices by periodically removing the sediment to drain. The use of high quality water in the secondary flow path maintains flow and pressure that would otherwise decline when the filter medium becomes clogged. The inventive device includes a FILTER HOUSING ASSEMBLY, THREE SOLENOID VALVES, a source of purified water from a REVERSE OSMOSIS SYSTEM, steam distiller or deionizing system, a non-pressurized STORAGE CONTAINER, a DEMAND DELIVERY PUMP to supply the flow and pressure to the SECONDARY FLOW PATH during the flush mode, and a CONTROLLER to switch from the PRIMARY FLOW PATH to the SECONDARY FLOW PATH that shuts off the existing inlet water, primary flow path and automatically initiates the secondary flow path that flows in reverse through the filter medium to drain or storage reservoir. The SECONDARY FLOW PATH is integral to the invention and uses the high quality water to maximizes the cleaning effect of the flush event.

DECLARATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND APPARATUS FOR A SELF CLEANING BACK FLUSH FILTER

the specification of which is attached hereto.

I further state that I do not know and do not believe that the above-named invention has ever been known or used in the United States before my invention thereof, or patented or described in any printed publication in any country before my invention thereof, or more than one year prior to this application, or in public use or on sale in the United States more than one year prior to this application; that the invention has not been patented or made the subject of any inventor's certificate in any country foreign to the United States on an application filed by me or my legal representatives or assigns more than six (6) months prior to this application; and that no application for patent or inventor's certificate on the invention has been filed by me or my representatives or assigns in any country foreign to the United States, except as identified below.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims (if included), as amended by any amendment if applicable.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Robert S. Bosko
Full Name of Inventor



Thursday, May 13, 2004 - 16:55:16

Robert S. Bulverde

Inventor's Signature

Date: 5-14-04

29890 Bulverde Lane #14, Bulverde, Texas 78163
Residence

CANADA
Citizenship

ursday, May 13, 2004 - 16:55:16

Docket No. FlushPat_210

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR**

Applicant or Patentee: **Robert S. Bosko**
For: **METHOD AND APPARATUS FOR A SELF CLEANING
BACK FLUSH FILTER**

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled as above and described in:

☒ the specification filed herewith.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

☒ no such person, concern, or organization
☐ persons, concerns or organizations listed below*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME: NOT APPLICABLE
ADDRESS: NOT APPLICABLE

☐ INDIVIDUAL
☐ SMALL BUSINESS CONCERN
☐ NONPROFIT ORGANIZATION

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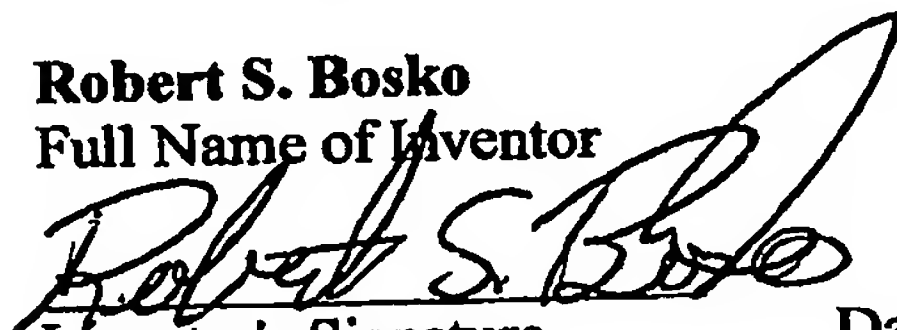
Thursday, May 13, 2004 - 16:55:16

status as a small entity is no longer appropriate (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Robert S. Bosko

Full Name of Inventor


Inventor's Signature

Date:

5-15-04
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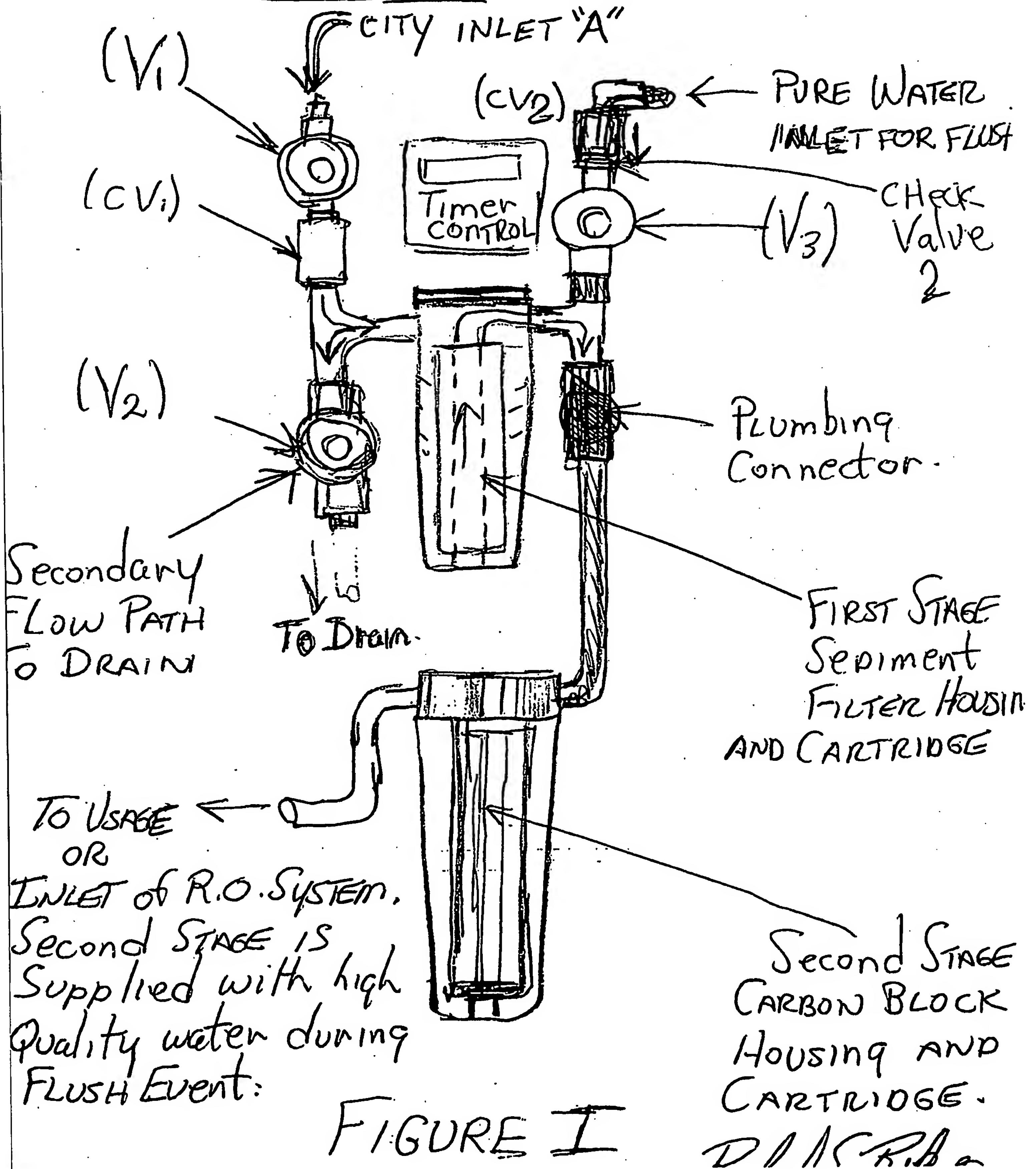
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PREFERRED EMBODIMENT MAY 13/20



Schematic of Preferred Embodiment

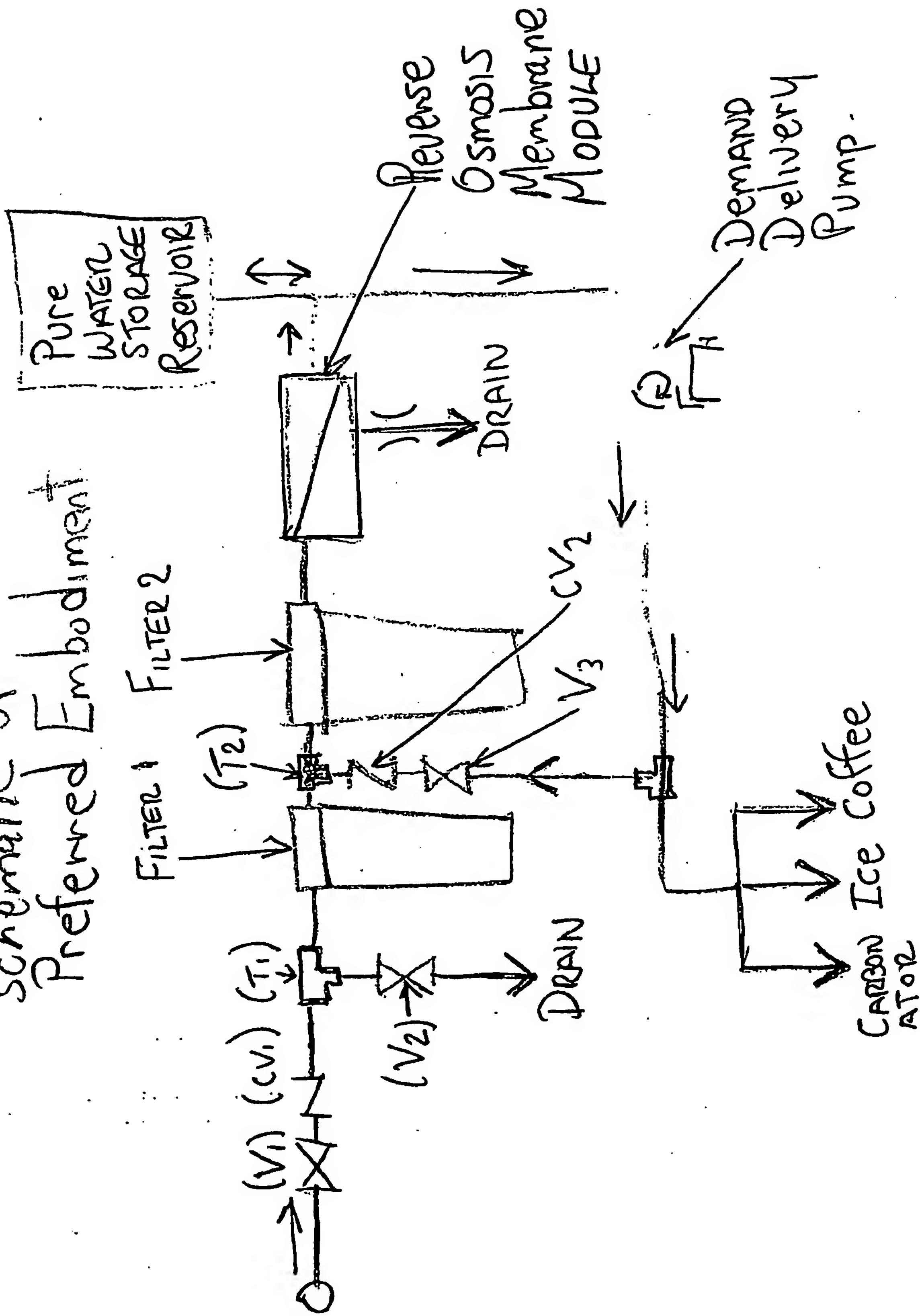


FIGURE 2

A.S. Bosko
Mar 13. 2004

Primary Flow Path (P.F.P.)

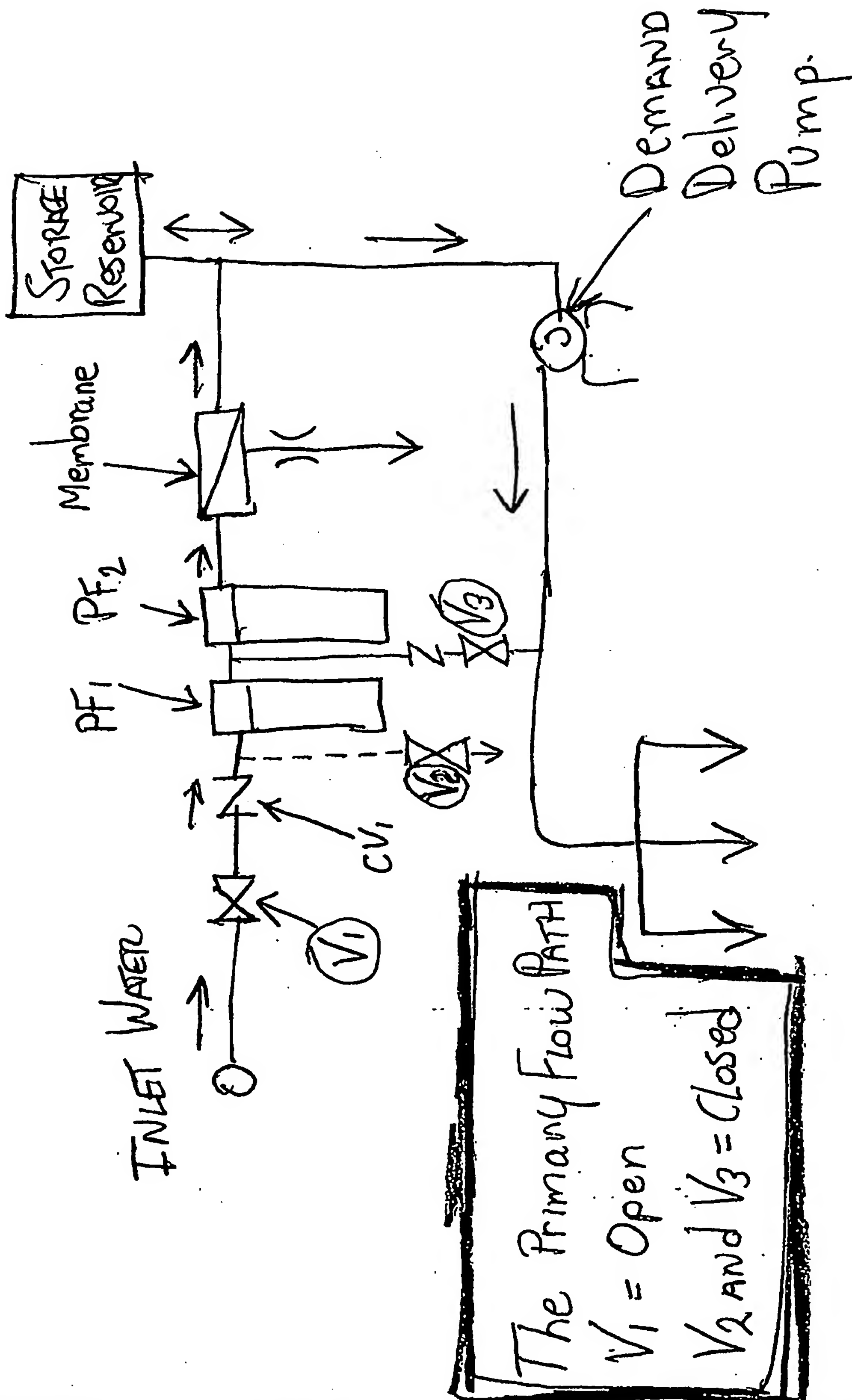
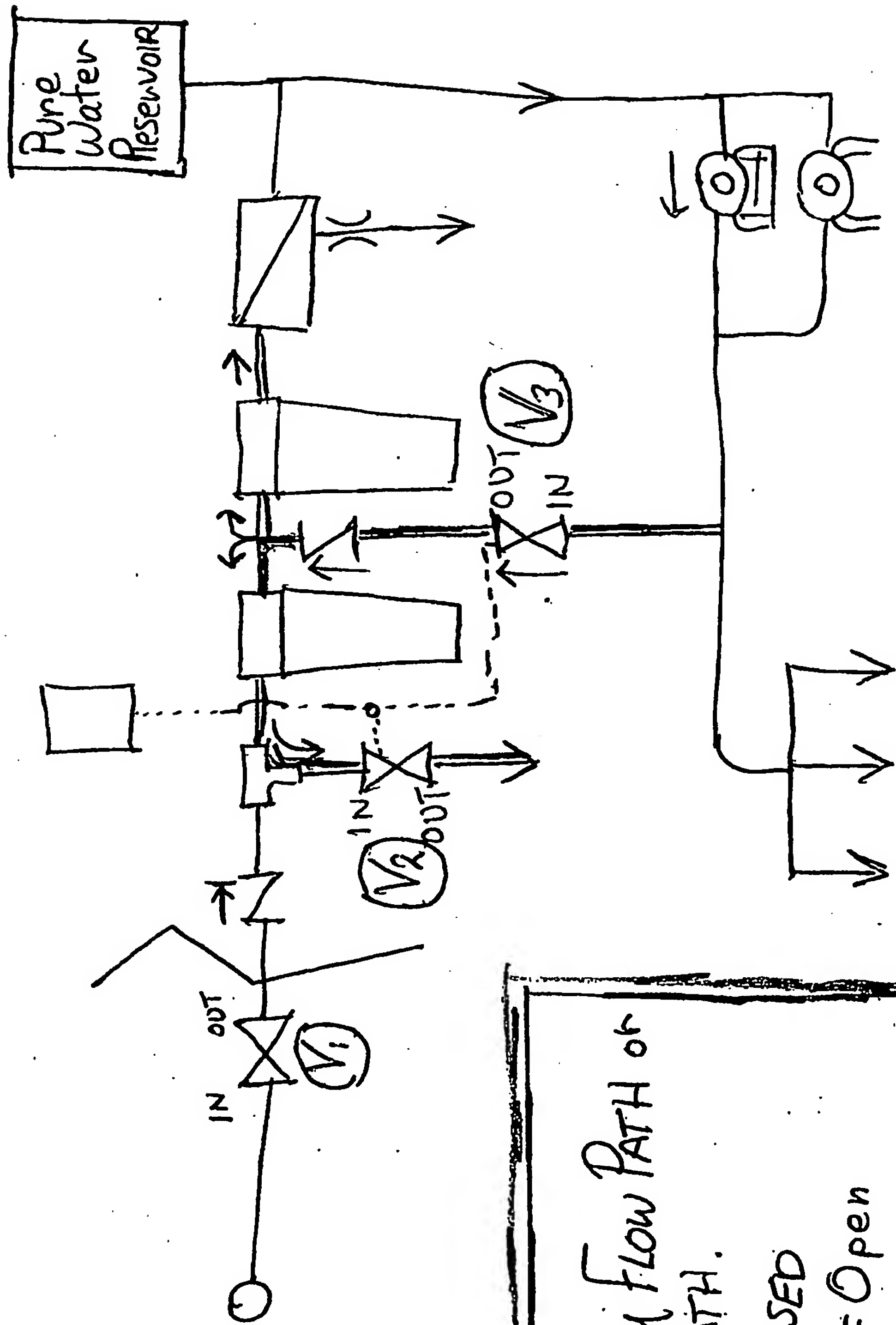


FIGURE 3

Secondary Flow Path (SFP)
According to the preferred embodiment.



Secondary Flow Path or
FLUSH PATH.

$V_1 = \text{CLOSED}$
 $V_2 \text{ and } V_3 = \text{OPEN}$

R.S. Bosko

May 13, 2004

FIGURE 4

METHOD FLOW CHART

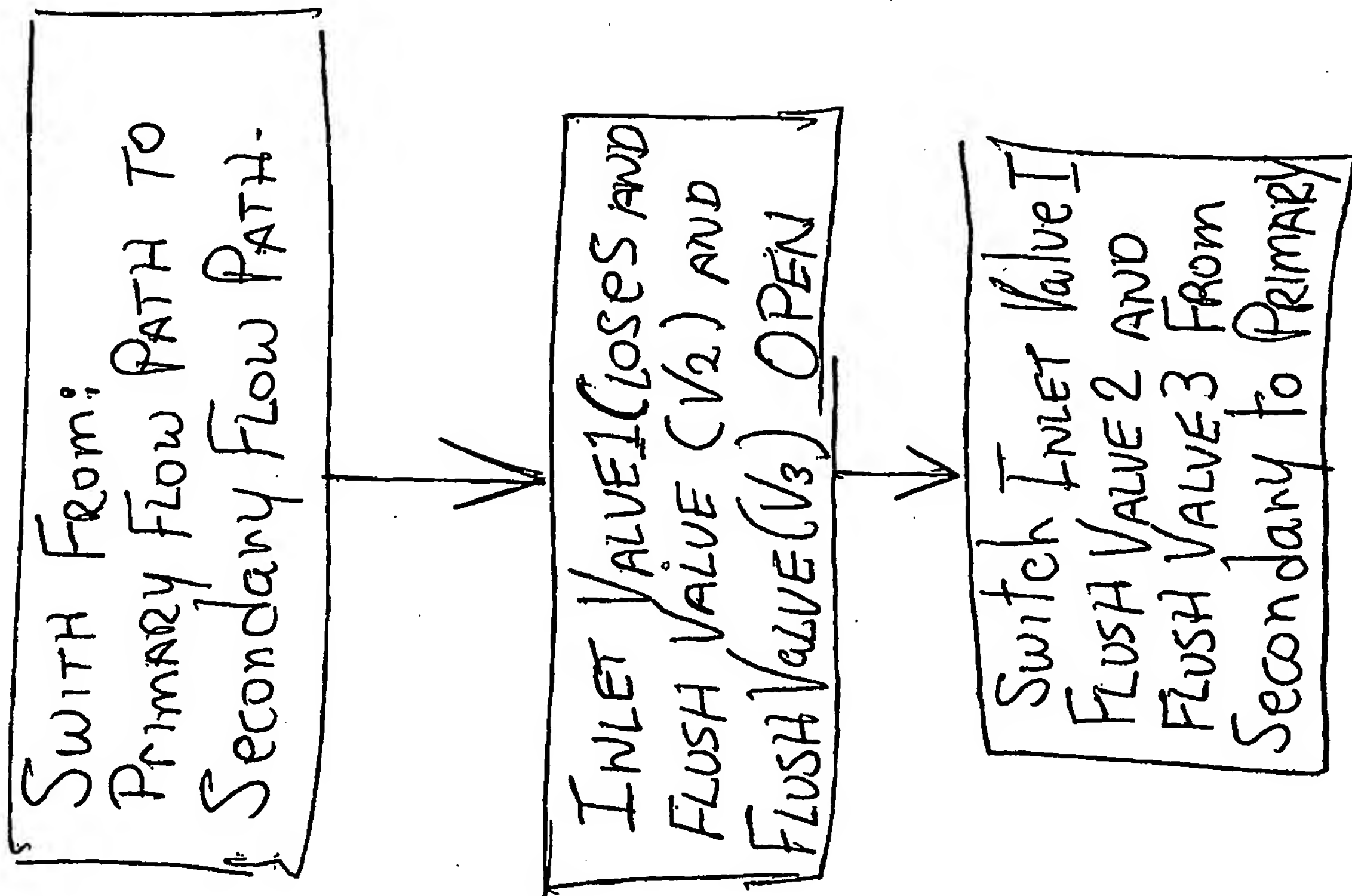


FIGURE 5

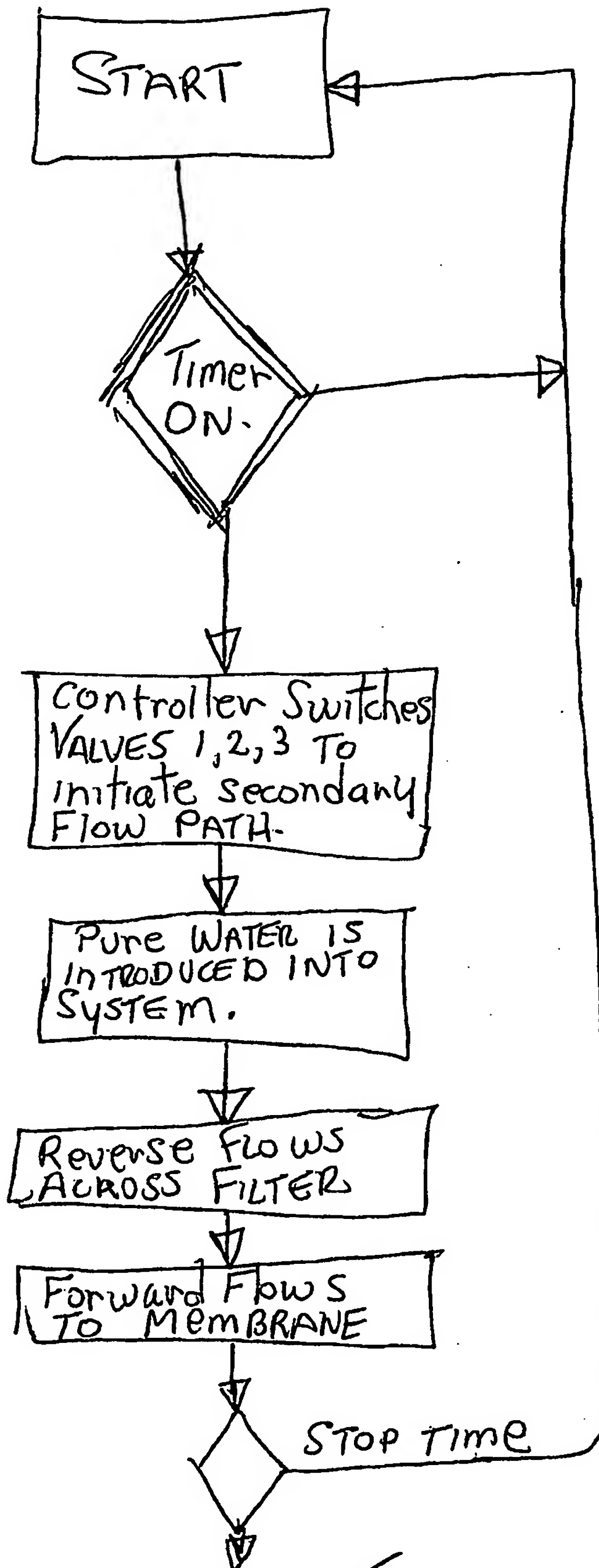


FIGURE 6

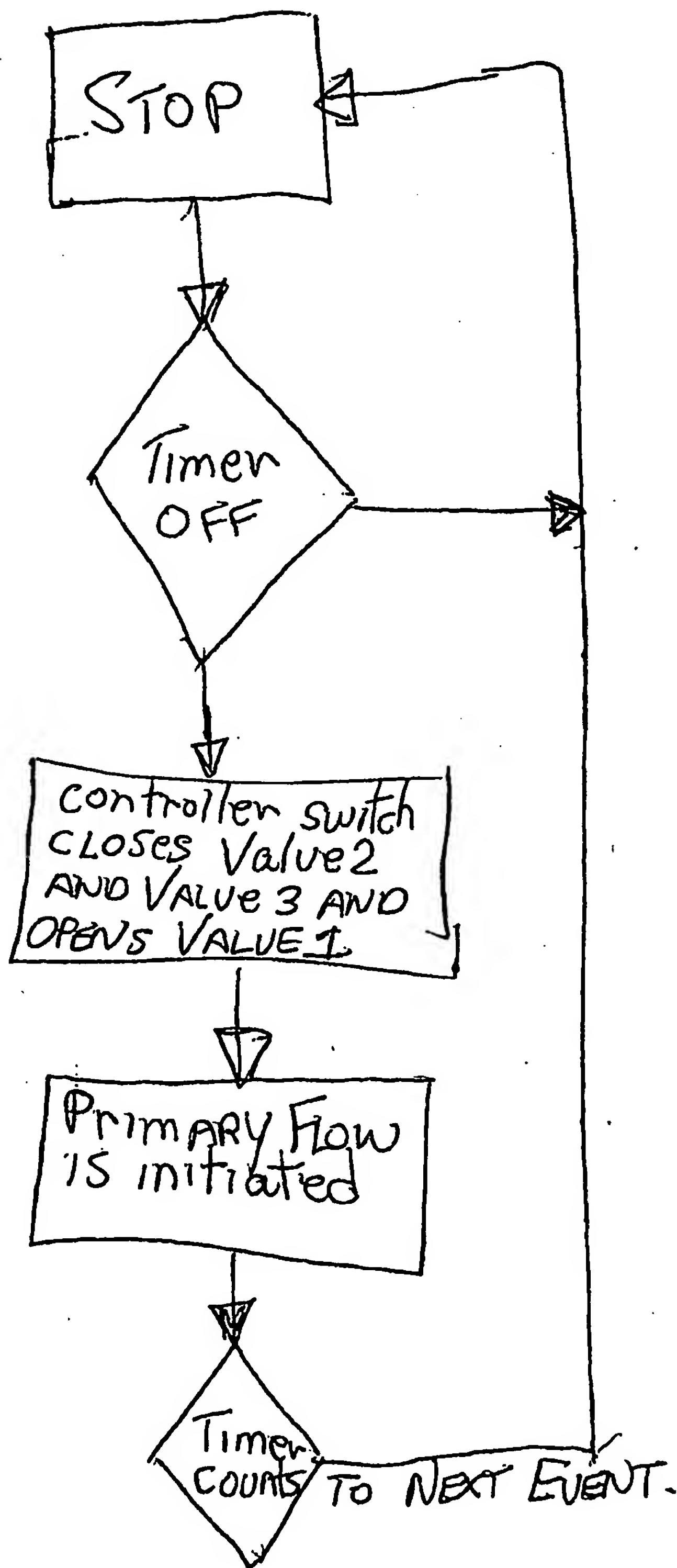
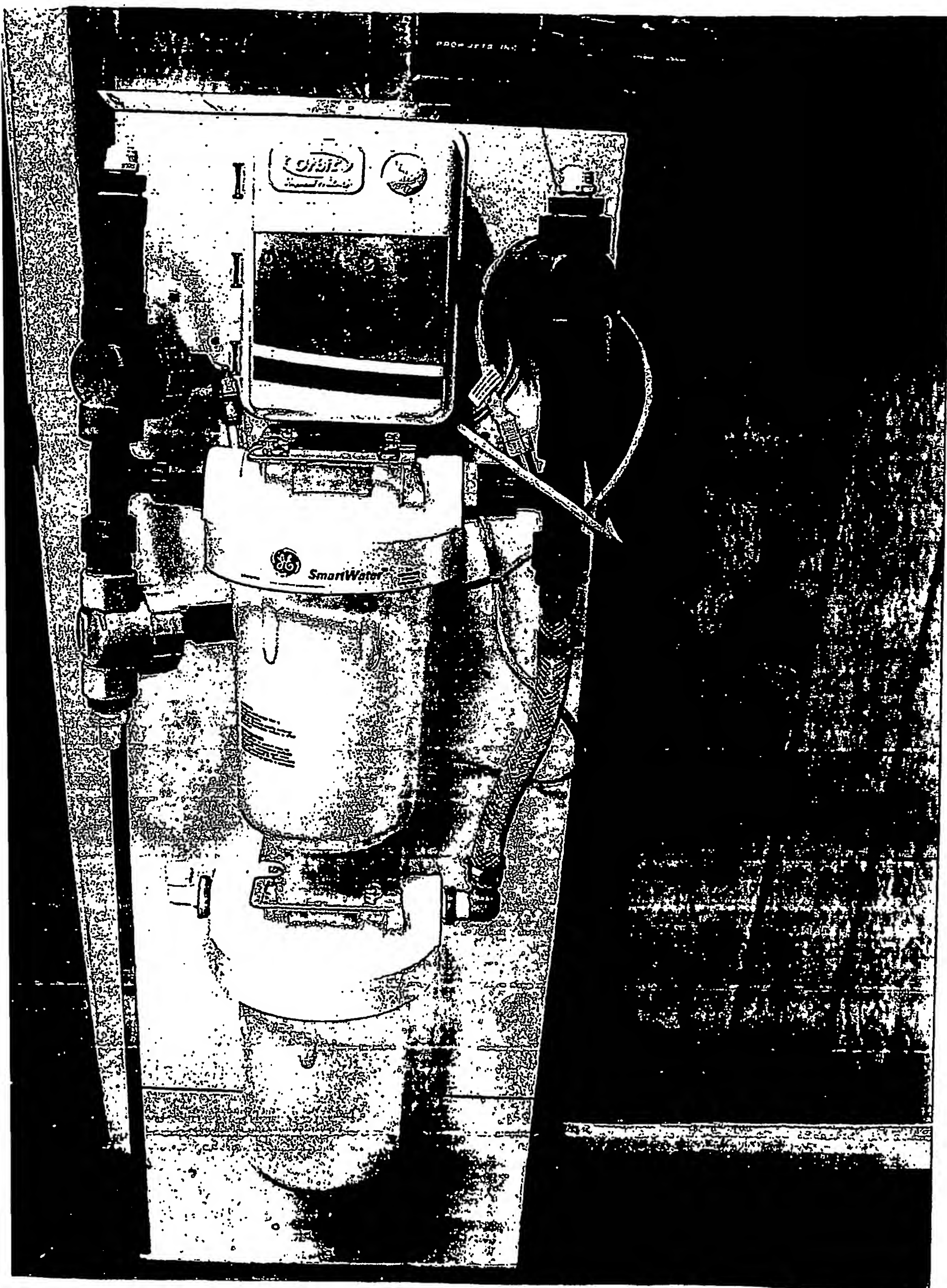


FIGURE 7



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